B-78 1937

Feeding Beef Calves

issued by
The Extension Service
Agricultural and Mechanical College of Texas and
The United States Department of Agriculture
H. H. Williamson, Director, College Station, Texas

Feeding Beef Calves

Geo. W. Barnes, Extension Animal Husbandman

The past decade has witnessed a large increase in the number of beef animals fed out each year by Texas farmers and cattlemen. A plentiful supply of high grade feeder calves is available in every section and a wide variety of feeds, a favorable climate, and suitable markets have contributed to this increase.

Many cattlemen who are primarily in the business of producing feeder calves have found that the feed lot has been of great value to them. Through actual feeding they have been able to get at first hand a clear cut illustration of how their calves develop under feed lot conditions. This information has helped them set up a practical ideal in their breeding program.

No hard and fast rules can be laid down to insure a profit in feeding enterprises, for experience is of vital importance. However, the principles of feeding remain constant, and offer an important starting point.

These Items Should Be Considered

The cattle breeder should aim always to produce animals of top quality. Such cattle cost little, if any, more to produce than scrubs but they bring a much larger return than scrubs or inferior cattle when sold as feeders or as fat cattle. Breeders of beef cattle should use the best purebred beef bulls available and should strive continually to improve their herds by a systematic breeding and culling program.

Steer calves make larger and more economical daily gains than heifer calves, but the heifers fatten in less time. When steer calves and heifer calves of the same breeding may be purchased for feeding at the same price per hundred weight, it is better to buy steers because they sell for a higher price when finished and return a larger profit.

Use Silage for Fattening Calves

Because forage can be more efficiently kept as silage, there is a slight advantage in using silage for fattening calves, provided it is part of a well balanced ration. If silage is fed, the supply should be cut down as the grain is increased. Calves which are to be highly finished should have no silage during the last 30 days of the feeding period. At least two pounds of dry roughage a day should be fed in connection with silage.

Recent feeding experiments have indicated that in sections where plentiful supplies of legume forages are available, but a scarcity of grain exists, cattle may be fed out on a ration consisting of more roughage,

somewhat more protein supplement, and less grain than is customary. Roughly, an additional 40 days is required to feed out cattle by this method, and it is better adapted to feeding out older animals than calves.

Cattle cannot go onto full feed suddenly for they cannot adjust themselves hurriedly to a change of diet. They must therefore be worked up to a full feed gradually and become accustomed to the ration. This period is known as the "warm up" period and lasts from two to six weeks, depending upon how long cattle are to be fed and whether or not they have been accustomed to any grain.

Cattle get onto full feed somewhat more rapidly when fed on a ration made up largely of roughage and not a great deal of grain. Too much grain at the beginning will likely lead to digestive disorders from which the cattle recover very slowly.

Margin Must Be Thought Of

"Margin" is used to designate the difference between the per pound price paid for feeder cattle and the per pound price received when sold as fat animals. There is a direct ratio between the cost of grain and the margin required. Thus a large margin is necessary when feeds are high in price, or when animals are carried to a high degree of finish.

During the past two decades there hos been a tendency for the cost of gain to increase out of proportion to the margin. This has made feeding operations less stable, and has placed more emphasis on the purchasing end of the enterprise. Buying is the biggest day's work in the feeding enterprise, and it is often correctly stated that more money is made in buying than in feeding.

Other conditions being equal, the more the animal weighs when placed on feed the less margin is necessary. This is because the final price is obtained on a greater number pounds of initial weight. This factor may be offset, however, if the heavier animals are substantially older and therefore make more expensive gains.

The larger the total amount of gain per head, the greater will be the margin needed to prevent loss. This is because the margin on the initial weight of an animal must cover a greater number of pounds of expensive gains.

The effort to secure a favorable price on feeder calves, however, should not lead the buyer to purchase inferior animals. The amount of margin on calves is not as important as that the calves have sufficient ability to feed well. The feeder should always remember that, over a period of years, his success is predicated on the conversion of feed into high quality beef at a low cost.

Look for Quality in Feeder Calves

The butcher block is the supreme and final test of the beef animal. The butchers want animals that will deliver the highest percentage of good cuts. Refinement of bone, lack of paunchiness, and small heads are very much desired by the butcher, but the calf which is too light of bone and has a small paunch and frail head would be unable to go through the feeding period and make economical gains.

Even though the strong, vigorous, capacious calf may not turn out at the finish to be the exact ideal of the butcher, he is usually the one that puts on the largest and steadiest and most economical gains, endures heavy feeding, finishes out with the greatest weight, and yields the highest percentage of prime beef.

The Back Is Important

In selecting feeder calves there is perhaps no one point more important for consideration than the back. A wide, straight, strong back with well sprung ribs is essential. The girth of the animal, that is, the distance around the body back of the shoulders, should be large. This means more room for the vital organs and insures a better constitution. Associated with a large heart girth are well sprung ribs and a wide back on which there is room for the disposition of a large quantity of desirable meat. A large heart girth also indicates greater depth of chest and greater digestive capacity.

The head is often an excellent index to the character of the feeder. The steer with a wide head is usually a good feeder, and one that will grow thick through the body and wide across the back. Width of muzzle is also important because it indicates capacity for feed consumption and for good breathing. The eye should be prominent and clear, indicating health and a quiet disposition, essential to an animal in the feed lot.

The neck is not a choice cut, but should be thick and short, for a thick compact body usually accompanies a short, thick neck.

Examine the Shoulders

The shoulders should be evenly covered, compact and wide at the top. While the width of the shoulder at the top is the mark of a good feeder, calves with extremely wide shoulders should not be selected for they have a tendency to be coarse.

The shoulders should blend smoothly with the neck, leaving no definite lines where the shoulders and neck meet. This imaginary line between the shoulder and neck is known as the "shoulder vein," and the expression "a full shoulder vein" means that the neck and the shoulder are well blended. Toward the rear, the shoulder should blend well into

the back and sides of the animal so that there is no tendency toward "tying in" which is always characteristic of an animal with poor heart girth.

The coupling, that is, the distance from the last rib to the hip point, should be short in accordance with the general compactness desired throughout. The calf should also be wide and well muscled in this region with no indications of being swaybacked. This is the region of the loin from which valuable cuts are taken.

The Rump Should Be Long, Wide and Level

The rump of the calf should be long, wide, and level. This is the region bounded in front by the hip points and extends backward to the tail-head and downward as far as the pin bones on either side of the tail-head. While width at the hip points is desirable, too much prominence is objectionable. Smoothness is the thing most desired in the finished calf and is difficult to obtain when the hip points are too prominent.

"Patchiness," or the assembling of fat in patches, is most common on animals with prominence of the pin bones or hip points. In the desirable type of feeder animal the pin bones are set wide apart and smoothly covered. A drooping rump is objectionable but is no more objectionable than one too prominent at the tail-head. A prominent tail-head is usually associated with prominence of hip bones and pin bones.

"Twist" is generally used to refer to the flesh between the thigh bones; "thigh" refers to the flesh on the outside of the thigh bones. Taken together they constitute the quarters. Plumpness, fullness, and thickness with good muscular development and flesh well carried down both on the inside and outside characterize good thighs and twists and consequently good quarters. Guard against the calf with poor thighs and a high scanty twist for he will not develop well fleshed quarters.

In the region of the flank, the calf should be full and low, so as to make the underline from front to rear straight.

Short Legs Are Desirable

Short legs are desirable for they contribute to the general compactness of the choice feeder calf and indicate an animal with a high dressing percentage.

Symmetry of outline, or balancing of parts, is very important in selecting calves. By symmetry is meant a general uniformity throughout with no parts out of proportion with any other part. Depth of chest should be balanced by depth of twist and width of shoulders should be accompanied by width throughout.

In addition to all the foregoing points, the calf should have a pliable skin of reasonable thickness, covered by a heavy mossy coat of hair. Pliability of skin and mossiness of hair indicate thrift and general well being.

The feeder desires uniformity in size, flesh, age, color and type, for uniform lots feed out evenly and offer a good appearance. Note the amount of fill calves carry when they are offered for sale or inspection. Look carefully for any appearance of stagginess as such calves are docked in price when finished.

In addition to what can be seen with the eye, it is desirable to know something of the calves' previous history, whether they have been vaccinated for blackleg and hemorrhagic septicemia, whether they have been taught to eat and what they were fed, where they came from, and the breedng behind them. This information is important, for it gives the feeder an indication as to the future health, constitution and performance on feed of the calves in question. One is seldom able to predict accurately gains of individual calves in the lot, but by knowing the history of the herd he may know what similar calves have done and be reasonably sure as to whether or not he is buying good doers.

Beef cattle on the market are classed according to the commercial use for which they are adapted. Primary markets issue price quotation on choice, good, medium and common grade calves, and very often make special mention of "good stocker calves." By noting the quotations on these grades and having in mind their comparative appearance, the feeder has a basis on which to buy when he goes to select his feeders.

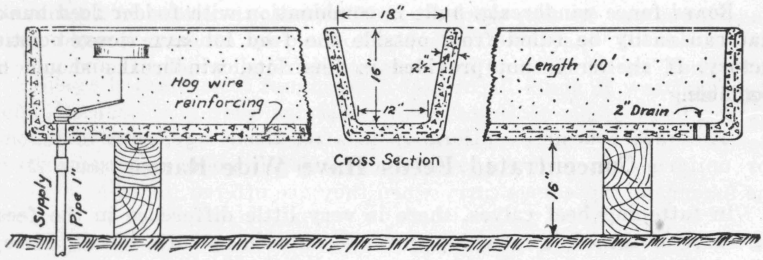
Locate Feed Lot Carefully

Feed lots for handling calves should be located and fenced with respect to other necessary factors such as storage barns, haystacks, silos, windbreaks, water facilities, shelter, shade and drainage.

Dry lots should have sheds with 20 square feet per head to protect calves from the weather and insure the best gains. Calves should be kept out of mud. They should certainly have a dry bed ground. This may be provided by litter put in the pens or by having additional pens to use for bedding space. A minimum of 75 square feet of feed lot space per calf is necessary under best conditions, while on sticky, black and poorly drained soil, 10 times as much space may be required.

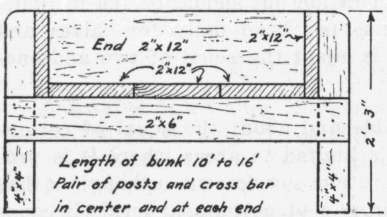
Fresh, Clean Water Must Be Available at All Times

A water trough of approximately 100-gallon capacity, preferably constructed of concrete (although lumber will do), will supply from 100 to 300 calves, depending on water pressure from the reservoir. It

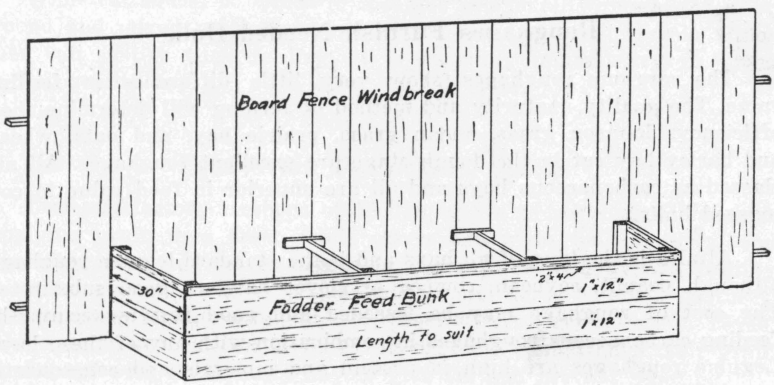


should be equipped with float valve and drain pipe. Such a trough may be moved and is easily cleaned with very little wastage of water. It should be so located as to allow waste water to drain outside of the feed lot. Calves will consume from five to eight gallons per day, depending on weather conditions and kind of feed. For safety the water supply should be capable of furnishing 10 gallons per head daily.

Use Feed Bunks for Grain and Hay



Here is a practical feed bunk for feeding grain, or a whole mixed ration. It is simple to build, strong, movable, and with no inside obstruction for harboring moldy feed. Feed bunks should provide one and one-half feet of linear space per calf when calves are hand fed in dry lot, whereas one-half foot is sufficient when self feeder is used.



Board fence windbreaks built in combination with fodder feed bunks that can easily be filled from outside the feed lot have proved satisfactory. If shelter is not provided in feed lots, windbreaks should be available.

Concentrated Feeds Have Wide Range

In fattening beef calves, there is very little difference in the feeding value of the basic fattening grain feeds such as corn, wheat, barley, milo, kafir, feterita, and hegari. Oats are considered more of a growing feed and are considered excellent to use at the beginning of the feeding period. Brewers' rice, rice polish or rice bran are better used in combination with other grains.

Blackstrap molasses is a carbonaceous feed in the same class as corn and is not a protein supplement. When the price of blackstrap molasses is within 70 percent of the price of grain it may profitably replace not more than 15 percent of the total ration per head.

With the possible exception of whole cottonseed, protein supplements for balancing the grain ration must be purchased. Cottonseed meal or cottonseed cake is the standard protein supplement. Cottonseed may replace cottonseed meal in a ration but should be fed in limited amounts not to exceed four pounds per head daily for calves and yearlings. Four pounds of cottonseed is about the equal of two and one-half pounds of cottonseed meal.

Peanut meal is extremely palatable and about the equal of cottonseed meal in food value, but its use is limited to areas where it is produced. Wheat bran is classed as a protein supplement although it has only about one-third the digestible protein of cottonseed meal. Because of its bulk, palatability and laxative effects it is sometimes used in starting calves on feed.

Roughages Furnish Needed Bulk

The sorghum roughages show very little difference in feeding value. The quality, maturity and method of feeding will determine their efficiency. Johnson grass, sudan grass, prairie hay, and oats, wheat, and barley hay cut in the dough stage are excellent roughages. All are classed as carbonaceous hays and all are superior in food value to cottonseed hulls.

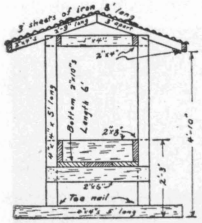
Alfalfa is the king of all hays and is the standard legume roughage, although peanut, soybean, cowpea or clover hay are good substitutes. The cost of roughage may be lessened and good results secured by feeding carbonaceous roughages in combination with any of these hays. Legume roughages are high in protein and minerals and consequently

the amount of protein supplement and minerals may be cut down where legume hay is used.

Silage is the easiest roughage to feed in all kinds of weather conditions. Because it is very palatable, the feeding of silage increases the amount of roughage consumed and eliminates waste. Its value depends on its quality, maturity and grain content.

Minerals Must Be Supplied in Rations

All carbonaceous feeds are low in lime and it should be supplied by mixing one-tenth pound of limestone flour or finely ground oyster shell in the grain ration per head per day.



Flake or loose salt should be kept before the calves at all times. If calves are on grass they should also be fed bone meal which may be mixed in equal parts with the salt.

The mineral supply is of sufficient importance to merit a special mineral box. A partition may be placed in it if minerals are to be fed separately. If preferred, open mineral boxes attached to ends of self-feeder or feed bunk may be used.

Should Feed Be Ground?

The value of grinding the grains and chopping or grinding roughage will in the main, depend upon the kind of feeds, their price and the cost of grinding. Calves are more efficient grinders of grain than older cattle. Combination feed such as ear corn and grain sorghum heads, and the hard grains of barley, wheat and brewers' rice should be crushed or ground. Unless they are followed by hogs the sorghum grains should be ground. Corn and oats need not be ground.

While calves can be forced to consume poor quality roughages when ground and mixed with grain and cottonseed meal, and certain situations can justify such feeding, it is certainly unnecessary to grind or chop quality hay.

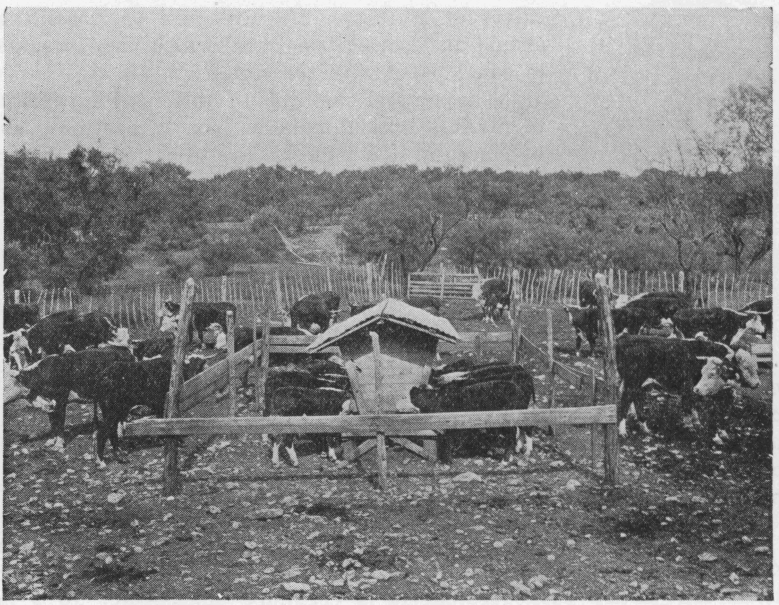
Feed Grain To Suckling Calves

Two satisfactory methods of feeding grain to suckling calves are: supplying grain in a creep while calves are with their mothers, and separating cows and calves except for nursing twice daily and feeding the calves grain. The latter is adapted to small herds on small pastures, whereas creep feeding is adapted to practically all conditions in Texas. Calves run in separate enclosures from mothers should have their grain supplement with fine quality hay to give fill and prevent scouring.

Creep Feeding Is Economical

For the stockman producing his own calves and grain feeds there is no more economical method of handling suckling calves than to allow them access to grain in a creep while following their mothers.

The advantages of this method of fattening calves are as follows: it adds weight and finish, it permits marketing at an early age, the cows are not sucked down so much, calves grow out more uniformly in size, labor costs are lessened, and there is very little shrinkage at weaning time.



Success in creep feeding operations depends on having good foundation stock, early calves, good grazing, and a central watering place for location of the calf creep. Although primarily suited to the stock farmer or small rancher, the larger ranchman may use creep feeding to advantage by fencing trap pastures of from one to three sections in area, cutting out some of the best cows and calves, purchasing grain feed from nearby farm areas, and marketing his calves as slaughter calves or fleshy feeders at weaning time. Such calves can be finished on full feed in pasture or dry lot if desired.

Creep and feed lot fencing should be strongly built. Lumber, poles or wire may be used.

The entrance to the calf creep should be from 16 to 20 inches wide and three feet high.

Calves must secure feed from creeps regularly in order to make good gains. Therefore a central watering place with nearby shade is necessary to attract cows and calves once or twice per day. Locating the salt and mineral box near the creep is another means of securing regularity of feeding. Shade will hold the cows while the calves eat.

The amount of grain necessary for creep feeding calves varies considerably with their age and the time they are started on feed. Early calves started on creep feeders in March or April make more economical gains, learn to eat more readily and will consume 15 to 20 bushels of corn or its equivalent in other grains by weaning time. Threshed grains are recommended for young calves, while older calves started in midsummer may be fed to advantage on ground grain sorghum heads or crushed ear corn with cottonseed meal supplement.

Suggested Rations for Creep Feeding Suckling Calves

150 to 200 lbs. Weight

Age of Calf (Month)	Month	Grain Mixture Ration No. 1	Average Daily Consumption	Grain Mixture Ration No. 2	Average Daily Consumption
2 to 3	April	Whole Oats	1 to 3 lbs.	Milo heads 6, c.s.m. 1	2 to 3 lbs.
3 to 4	May	Shelled corn 2, oats 1	2 to 3 lbs.	Milo heads 6, c.s.m. 1	3 to 4 lbs.
4 to 5	June	Shelled corn 5, oats 2	3 to 4 lbs.	Milo heads 5, c.s.m. 1	4 to 6 lbs.
5 to 6	July	Corn 6, oats 3, c.s.m.1	4 to 6 lbs.	Milo heads 5, c.s.m. 1	6 to 8 lbs.
6 to 7	Aug.	Corn 8, oats 2, c.s.m.1	6 to 7 lbs.	Milo heads 4, c.s.m. 1	8 to 9 lbs.
7 to 8	Sept.	Corn 7, oats 1, c.s.m.1	7 to 9 lbs.	Milo heads 4, c.s.m. 1	8 to 10 lbs.
8 to 9	Oct.	Corn 6, c.s.m. 1	9 to 11 lbs.	Milo heads 4, c.s.m. 1	10 to 12 lbs.

In these rations the grain sorghums may be interchanged with corn. Wheat, barley or rye may be substituted pound for pound in these rations but must be ground. Pea size cake works to an advantage when threshed oats, corn or grain sorghums are fed, but cottonseed meal is pereferred in rations using ground feeds. The amount of cottonseed meal or cake may be reduced when an abundance of green pasture is available, but when the pastures get dry the amount must be increased.

Additional weight and finish can be given weaned creep fed calves by placing them in dry lot and continuing the same grain feeds in the self feeder, and economical gains can be made this way. The calves

should also be given access to all the hay they will consume unless ground grain sorghum heads or crushed ear corn is used. In this case, little additional roughage is needed.

Calves in Feed Lot Should Double in Weight

The better the quality of calves the longer they can profitably be fed. A six month's feed will be required to fatten well bred 400 pound steer calves. If calves are as light as 350 pounds when started on feed, seven months will be required. More rapid gains may be secured on steer calves the second 90 to 100 days of feeding than the first. In the fattening period a calf should at least double his weight. A gain of two pounds per day may be considered satisfactory.

The amount of feed necessary to fatten a feeder calf will depend upon the condition, quality, and weight of the calf and the ability of the feeder. Under ordinary farm conditions, if feeding calves of good quality, the feeder should have 1,500 pounds of shelled corn or one ton of grain sorghum heads or ear corn, 300 pounds cottonseed meal, and from 1,500 pounds to one ton of roughage per head.

At the beginning of the fattening period the calves should be started on a little grain and a lot of roughage and gradually changed to a little roughage and a lot of grain. The skill with which a person times and makes these changes largely determines his success as a feeder. The following rations, based on experimental trials, illustrate ways by which rations may be gradually changed, and may be safely used as guides in dry lot feeding of calves.

Rations for Weaned Calves

350 lbs. to 400 lbs. Weight

RATION NO. 1

(Fed shelled or threshed grain)

	1st 15 Days	2nd 15 Days	2nd 30 Days	3rd 30 Days	4th 30 Days	5th 30 Days	6th 30 Days
Grain	2.75 lbs.	4.0 lbs.	6.75 lbs.	7.5 lbs.	8.5 lbs.	9.5 lbs.	11.0 lbs.
Cottonseed meal	0.75 lbs.	1.0 lbs.	1.5 lbs.	1.6 lbs.	1.75 lbs.	1.8 lbs.	2.0 lbs.
Roughage*	12.0 lbs.	12.0 lbs.	10.0 lbs.	9.5 lbs.	9.0 lbs.	8.5 lbs.	7.0 lbs.
Limestone flour	0.1 lbs.	0.1 lbs.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.

RATION NO. 2

(Fed ground grain sorghum heads or crushed ear corn)

	1st 15 Days	2nd 15 Days	2nd 30 Days	3rd 30 Days	4th 30 Days	5th 30 Days	6th 30 Days
Grain	3.5 lbs.	4.5 lbs.	7.5 lbs.	8.5 lbs.	9.5 lbs.	10.5 lbs.	12.5 lbs.
Cottonseed meal	0.75 lb.	1.0 lb.	1.5 lbs.	1.6 lbs.	1.75 lbs.	1.8 lbs.	2.0 lbs.
Roughage*	12.0 lbs.	12.0 lbs.	10.0 lbs.	9.5 lbs.	9.0 lbs.	8.5 lbs.	7.0 lbs.
Limestone flour	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.

RATION NO. 3

(Fed ground grain sorghum heads and silage)

	1st 15 Days	2nd 15 Days	2nd 30 Days	3rd 30 Days	4th 30 Days	5th 30 Days	6th 30 Days
Grain	2.0 lbs.	5.0 lbs.	7.5 lbs.	8.5 lbs.	9.5 lbs.	10.5 lbs.	12.5 lbs.
Cottonseed meal	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.
Cane silage	16.0 lbs.	20.0 lbs.	20.0 lbs.	20.0 lbs.	18.0 lbs.	16.0 lbs.	12.0 lbs.
Hay	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.	2.0 lbs.
Limestone flour	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.

* Roughage assumed to include no legume hay. If legumes furnish all the roughage, cottonseed meal may be cut 25% and limestone flour eliminated in these rations.

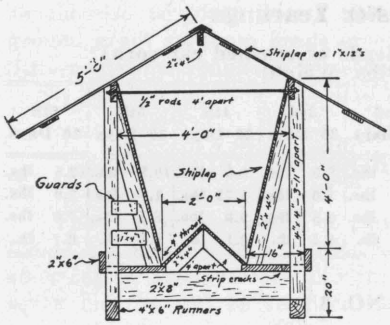
Self Feeders Save Labor

The self-feeder may be used to advantage to feed grain to calves if a full grain ration is to be fed.

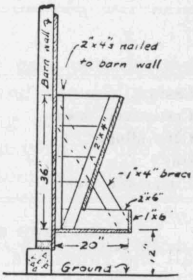
In self feeding beef calves, the complete ration—grain, protein supplement, roughage—is all ground together. Grain sorghum bundles furnish both grain and roughage and for this reason are almost always used in self feeding on farms.

Well matured grain sorghum bundles usually weigh from 8 to 10 pounds, of which about 60 percent is stalks and leaves and 40 percent heads. The head contains about 75 percent grain. Ear corn, grain sorghum heads or shelled grain are added to the ration to increase the grain content as the feeding process advances. The protein supplement, preferably cottonseed meal, is increased rapidly to add palatability to the ration.

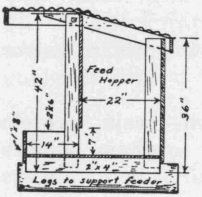
Careful attention must be given to uniform mixing of rations and to frequent changes of the percentage of grain, protein supplement and roughage. As in hand feeding, the guiding principle is a gradual increase in grain and a corresponding decrease in roughage content of ration. The following suggested ration mixed on an approximate ton basis can be used as a guide in making changes.



This self feeder has a capacity of 125 bushels of grain and is suitable for feeding 60 to 80 calves in feed lot.



This self feeder is suitable for feeding one or more calves under shed.



This range self feeder is capable of handling 30 calves. It holds 30 bushels of grain or one-half ton of cake, and is designed especially for creep feeding calves.

Calves fed a complete ration in open bunks should clean up feed daily with very little feed left in bunks over night. Feed should be ground fine enough to crack the grain sorghum grains and to crack shelled corn into four or five pieces. All feeds should be thoroughly mixed so that a few calves will not secure extra grain or cottonseed meal and leave others with only roughage.

Feed bunks should be cleaned each day and feeds removed fed to other livestock. Cottonseed may be substituted for meal at the rate of one and two-thirds pounds of cottonseed for one pound of meal but cottonseed should never exceed 20 percent of the whole mixture.

Rations for Calves or Yearlings

400 lbs. to 600 lbs. Weight

(Self fed)

1st 15 Days
1900 lbs. ground grain sorghum bundles
100 lbs. cottonseed meal
10 lbs. limestone flour

2nd 15 Days
1750 lbs. ground grain sorghum bundles
150 lbs. cottonseed meal
10 lbs. limestone flour

2nd 30 Days
1800 lbs. ground grain sorghum bundles
200 lbs. cottonseed meal
10 lbs. limestone flour

3rd 30 Days
1700 lbs. ground grain sorghum bundles
100 lbs. crushed ear corn
200 lbs. cottonseed meal
10 lbs. limestone flour

4th 30 Days
1450 lbs. ground grain sorghum bundles
300 lbs. crushed ear corn
250 lbs. cottonseed meal
10 lbs. limestone flour

5th 30 Days
1150 lbs. ground grain sorghum bundles
600 lbs. crushed ear corn
250 lbs. cottonseed meal
10 lbs. limestone flour

6th 30 Days
950 lbs. ground grain sorghum bundles
800 lbs. crushed ear corn
250 lbs. cottonseed meal
10 lbs. limestone flour

Hogs Following Cattle Pay Dividends

It usually pays to use hogs in cattle feed lots to utilize the grain that would otherwise go to waste. Good, well-bred, thrifty pigs do best. Shotes weighing 60 to 75 pounds are most desirable. They should be removed when they weigh 160 to 175 pounds, or when they start climbing up into the cattle feed troughs. Never use hogs in feed lots where heifers are being fed.

The number of hogs to use varies with the age of the cattle and the kind of feed. When whole grain is fed, one shote per calf is about right, and when grain is ground one shote to about four calves is enough. Older cattle require more pigs than calves.

Pigs following cattle should get some feed in addition to what they pick up in feed lot. A field adjoining the feed lot planted to small grain for winter use and sudan or peas for summer grazing will usually fur-

nish most of the needed feed not provided in the droppings. Pigs should have free access to such fields as well as to the feed lot.

In addition, they will do better if they receive one-fourth pound of tankage daily. If green grazing is not available, hogs should receive a mixture consisting of one-fourth alfalfa leaf meal and three-fourths tankage, at the rate of one-half pound of the mixture per pig per day. A mineral mixture of two parts bone meal and one part salt should be self fed.

Pig feed troughs and water troughs should be located outside the cattle feed lot. A good supply of fresh, clean water should always be available, and shelter-shade in summer and warm quarters in winter must be provided to get best results.

Pigs following cattle will gain from three-fourths to one pound per pig per day. After they reach 160 to 175 pounds they should be finished on a full grain ration and protein supplement. Whole grain can be fed in a self feeder with a protein supplement of equal parts of tankage and cottonseed meal.

Consider These Shipping Suggestions

Certain precautions should be taken to avoid excessive shrinkage in going to market. Water and salt should be allowed up to the time of loading. If it is to be a long haul, it is advisable to cut the concentrate allowance in half and allow fill on dry hay 12 to 24 hours before loading. Prairie hay is ideal for this purpose. Since an excessive fill is not desired on the stockyards, there is no advantage in givng a heavy allowance of salt prior to loading.

If possible, sort cattle according to grade and avoid mixing cattle from different lots. Avoid over-heating. Load cars slightly in excess of their minimum rated capacity so that full advantage of the minimum rail rate may be obtained. A thirty-six foot stock car has a minimum of 22,000 pounds; a forty-foot car 24,500 pounds. If the average shrink expected is 5% then load from the feedlot about 23,000 pounds in a 36-foot car or about 26,000 pounds in a 40-foot car. See that cars are well bedded with at least two inches of sand dampened with water in hot weather.

Cooperative Extension Work in Agriculture and Home Economics, Agricultural and Mechanical College of Texas and United States Department of Agriculture Cooperating.
Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.
100M—2-37